

Description

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A Multipurpose Martial Arts Training Device

Technical Field

10 The present invention relates to training equipment used in martial arts. In particular, a multipurpose device that may be used as a staff, a stretching aid or separated into two clubs.

Background of the Invention

15 Training for the martial arts takes on many aspects. In addition to teaching self-defense, it presents a physical fitness regimen to condition the body. Part of the training includes the use of conventional weapons, such as a staff sometimes called a Bo Staff, or a Jo Staff, which
20 is shorter than a Bo, as well as clubs, sometimes called Escrima or Kali Sticks.

Typically, the practitioner would train with one weapon at a time. To change weapons in the middle of a session, the student must interrupt or delay the action to
25 make an exchange. At times, the student may be engaged in a battle with two or more opponents with different weapons. In such situations, it may be advantageous to have the use of more than one weapon. For example, a student in combat may wish to switch from a Bo Staff to Kali Sticks, but may
30 be unable to do so with conventional training weapons.

Additionally, the physical fitness aspect of the sport generally requires warm-up exercises that include

stretching the muscles. For some advanced techniques, stretching is essential. Students practicing such techniques require extreme flexibility in the legs, including stretching to nearly 180 degrees. Stretching
5 aids can be used to assist with the flexibility exercises, but providing and carrying such additional equipment can be burdensome. Presently, there is no simple stretching aid that would serve other purposes. It would be advantageous to combine such equipment with other martial arts equipment
10 to minimize transporting excessive amounts of devices and to reduce storage area requirements.

Therefore, there is a need for a device that can easily convert from one weapon to another during training without having to interrupt the training to exchange
15 weapons. In addition, there is a need for a device that may be utilized as a weapon during training as well as a stretching tool prior to weapons training.

Summary of the Invention

20 The present invention provides modular martial arts training devices comprising at least two tubular components, each having at least one joining end, an interior surface and an exterior surface, and a connection means affixed within the interior surfaces of each of the
25 joining ends to removably affix the tubular components together to form a continuous shaft.

In one embodiment, the continuous shaft comprises two tubular components, a first tubular component and a second tubular component with the connection means comprising a
30 receiving means affixed within the interior surface of the joining end of the first tubular component and a locking means affixed within the interior surface and projecting

from the joining end of the second tubular component. In one embodiment, the receiving means consists of a pin mounted transverse within the interior surface of the first tubular component and setback from the joining end; and the
5 locking means comprises a cylindrical component having an upper end, a lower end and an external diameter, the external diameter able to be received within the joining end of the second tubular component and is affixed within the interior surface of the second tubular component, while
10 the upper end projects from the joining end of the second tubular component and has a hook to engage the pin. In a preferred embodiment, the hook comprises at least one J-shaped notch in the upper end of the cylindrical component for engaging the pin.

15 In another embodiment, the locking means further comprises a spring having a bottom end and a top end fitted within the cylindrical component, with the bottom end affixed within the lower end of the cylindrical component and the top end being about flush with the upper end of the
20 cylindrical component when uncompressed. In a preferred embodiment, the locking means comprises a spring and a shaft within the spring with one end of the shaft affixed to the top end of the spring and the other end slidably affixed to the lower end of the cylindrical component, with
25 the bottom end of the spring affixed to the lower end of the cylindrical component.

In yet another embodiment the exterior surface of the first and second tubular components comprise gripping means.

30 Another aspect of the invention provides a method of converting the martial arts training staff into martial arts training clubs comprising the steps of; grasping the

training staff about the middle of a first tubular component with one hand and grasping about the middle of a second tubular component with the other hand; compressing the first tubular component toward the second tubular component; twisting the first tubular component in one direction while twisting the second tubular component in the opposite direction disengaging the first tubular component from the second tubular component; and separating the tubular components into martial arts training clubs.

Another aspect of the invention provides a martial arts training device as well as a stretching tool for flexing the user's legs prior to training. The device comprises at least two tubular units having at least one joining end, an interior surface and an exterior surface, with a connection means affixed within the interior surface of joining ends to removably affix the tubular units together to form a continuous shaft, and at least two leg attachment means able to be affixed to the exterior surfaces of the at least two tubular units.

In one embodiment of this aspect of the invention, the continuous shaft comprises three tubular units, a first tubular unit having a first end and a second end, a second tubular unit having a third and fourth end and an internal surface and an external surface, and a third tubular unit having a fifth and sixth end. Preferably, the first tubular unit and the third tubular unit further comprise a plurality of apertures positioned linearly along the lengths of the first and third tubular units. The connecting means preferably comprises a threaded dowel extending from the second end of the first tubular unit, a threaded dowel extending from the fifth end of the third tubular unit, and the internal surface of the third and

fourth ends of the second tubular unit being threaded and able to receive the threaded dowels extending from the first tubular unit and the third tubular unit. Alternatively, the connection means comprises a threaded
5 dowel extending from the third and forth ends of the second tubular unit, and the internal surface of the second end of the first tubular unit and the fifth end of the third tubular unit being threaded and able to receive the threaded dowels extending from the second tubular unit.
10 Preferably, the threading on the threaded dowel of the first tubular unit is a right-handed thread and the threading on the threaded dowel of the third tubular unit is a left-hand thread, with the threading on both tubular units being the same pitch. Alternatively, the threading on
15 the threaded dowel on the third end of the second tubular unit is a right-handed thread and the threading on the threaded dowel on the forth end of the second tubular unit is a left-handed thread. Preferably, the threading is at about 1 to 3 threads per inch and a pitch of about a 25 to
20 about a 45-degree orientation.

In another embodiment, the at least two leg attachment means comprise adjustable straps with a pin affixed to one end, the pins able to be received by any of the plurality of apertures of the first and third tubular units. To
25 prevent the leg attachment means from slipping at the legs of the user, one embodiment consists of a restraining means removably affixed to both adjustable straps and held in place behind the user.

In yet another embodiment, the external surface of
30 the second tubular unit comprises a gripping means.

In a preferred embodiment, the martial arts training device comprises three tubular units, a first tubular unit

having a first end and a second end, a second tubular unit having a third and fourth end, and a third tubular unit having a fifth and sixth end, with the second tubular unit having an internal surface and an external surface, the first tubular unit and the third tubular unit further comprising a plurality of apertures positioned linearly along their lengths; a connection means comprising a right-handed threaded dowel extending from the second end of the first tubular unit, a left-handed threaded dowel extending from the fifth end of the third tubular unit, and the internal surface of the third and fourth ends of the second tubular unit being threaded and able to receive the threaded dowels extending from the first tubular unit and the third tubular unit to removably affix the three tubular units together to form a continuous shaft; and two leg attachment means comprising an adjustable strap and a pin affixed to one end of the adjustable strap for each of the two leg attachment means, the pins being able to be received by the plurality of apertures of each of the first and third tubular units. Alternatively, the connection means may comprise a right-handed threaded dowel extending from the third end of the second tubular unit, a left-handed threaded dowel extending from the forth end of the second tubular unit, and the internal surface of the second end of the first tubular unit and the fifth end of the third tubular being threaded and able to receive the threaded dowels extending from the second tubular unit to removably affix the three tubular units together to form a continuous shaft.

In yet another aspect of the invention, a method for assisting flexibility and stretching exercises using the modular martial arts training device comprising the steps

of; affixing a first tubular unit to a second tubular unit by inserting a right-handed threaded dowel extending from the second end of the first tubular unit into the third end of the second tubular unit; affixing a third tubular unit to the second tubular unit by inserting a left-handed threaded dowel extending from the fifth end of the third tubular unit into the fourth end of the second tubular unit; connecting one adjustable strap onto the right leg; connecting one adjustable strap onto the left leg; affixing the right leg to the first tubular unit by inserting a pin connected to the adjustable leg strap into one of a plurality of apertures on the first tubular unit; affixing the left leg to the third tubular unit by inserting a pin attached to the adjustable leg strap into one of a plurality of apertures on the third tubular unit; and rotating the second tubular unit, thereby unthreading the first tubular unit and the third tubular unit from the second tubular unit, thereby flexing and stretching the user's legs.

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Description of the Figures

Figure 1: Is a diagrammatic representation of the staff/clubs embodiment of the present invention showing (A) the side view; (B) the top view; (C) the bottom view; (D) a side view of an exploded diagrammatic representation with spring compressed; (E) a bottom view of the female club; (F) a top view of the female club; (G) a top view of the male club; and (H) a bottom view of the male club.

Figure 2: Is a diagrammatic representation of the staff/stretching tool embodiment of the present invention showing (A) the side view; (B) the top view; (C) the bottom view; (D) a side view of an exploded diagrammatic

representation; (E) a bottom view of the left tubular unit; (F) a top view of the left tubular unit; (G) a top view of the right tubular unit; (H) a bottom view of the right tubular unit; (I) a top view of the central tubular unit; 5 (J) a bottom view of the central tubular unit; (K) a view of the restraining means; and (L) a view of the leg attachment means.

Detailed Description

10 Unless defined otherwise, all terms used herein have the same meaning as are commonly understood by one of skill in the art to which this invention belongs. All patents, patent applications and publications referred to throughout the disclosure herein are incorporated by reference in 15 their entirety. In the event that there is a plurality of definitions for a term herein, those in this section prevail.

The term "affixed" as used herein refers to a means for securely retaining one component of the device to 20 another element by a variety of means known to one skilled in the art, such as, for example a cylindrical component may be connected to a tubular component by friction fit, welded, brazed, press-pinned, riveted, bolted, or with adhesive.

25 The term "connection means" as used herein refers to a means for to a mechanism for reversibly fastening two elements of the invention together, such as the two tubular components. A variety of connecting mechanisms known in the art may be utilized with the present invention such as for 30 example, a pressure twist connector that provides spring tension to maintain force against a hook and pin connection between two tubular components.

The term "locking means" as used herein refers to a mechanism for securely fastening two elements of the invention together, such as the two tubular components, so that they cannot be separated during use without action by the user to disengage the elements. A variety of means known to one skilled in the art may be used to perform this function, such as, for example a pressure twist lock that upon compressing the two joining ends of the tubular components together engages the pin of one tubular component in the slot of the "J" hook on the other tubular component and upon twisting locks the pin in the hook.

The term "receiving means" as used herein refers to a passive means for engaging one element of the invention by another element. A variety of means known to one skilled in the art may be utilized such as for example a pin mounted transverse within the interior diameter of a tubular component that is engaged by a hook provided on another tubular component.

The term "gripping means" as used herein refers to a means for assisting a user in securely holding onto an element of the invention, such as a tubular component or tubular unit, to prevent slipping. A variety of means known to one skilled in the art may be utilized with the present invention, such as, for example tooling the exterior surface of a tubular component to create a textured surface that would increase the friction between the users hand and the tubular component when gripping the device.

The term "attachment means" as used herein refers to a variety of means for affixing an element of the invention to the user, such as for example, a strap secured about the user's leg and affixed to a tubular unit of the invention

by a pin affixed to the strap and used to engage an aperture in the tubular unit.

The term "restraining means" as used herein refers to a means for preventing migration of the attachment means along the user's legs when the device is used for stretching. A variety of means known to one skilled in the art may be utilized for this function, such as, for example, a harness secured to one attachment means about the user's leg that runs behind the user and attaches to the other leg attachment means.

The present invention provides modular martial arts training devices comprising at least two tubular components with a connection means. In one embodiment the device comprises two tubular components and in another embodiment the device comprises three tubular units.

TWO COMPONENT MARTIAL ARTS TRAINING DEVICE

In one embodiment, the device 10 comprises two tubular components, a first tubular component 12 and a second tubular components 12 and 14, each having a joining end, an interior surface and an exterior surface, and the connection means affixed within the interior surfaces of each of the joining ends to removably affix the tubular components, 12 and 14 together to form a continuous shaft or staff.

The tubular components, 12 and 14, when separated, constitute training clubs. The first and second tubular component 14s may be identical in their dimensions and composition or they may be different. They are generally cylindrical in shape and uniform in their dimensions. For example, if the thickness of the tubular component is 1/8 inch, this will generally be its thickness throughout its

entire length. However, one skilled in the art would recognize that variations in the uniformity of the tubular components, 12 and 14 may be desired and adjust the dimensions accordingly. Such as, for example, an enlarged or pointed aspect on the non joining end of the tubular component to provide for different training methods associated with such aspects; an uneven texturing of the tubular components surface for enhanced gripping or increased damage on impact with an object or opponent; or increasing the weight of one end of the tubular unit to increase force of impact by, for example, anchoring a lead weight on the interior of one end of the tubular component or utilizing solid cylindrical stock material to prepare the tubular component or one end of the tubular component. Preferably at least a portion of the external surface of each tubular component comprises a gripping means 22 such as for example machined serrations, or leather or rubber wraps. Preferably, the gripping means 22 is a machined surface in anodized aluminum material.

The thickness of the tubular components, 12 and 14 will depend on the material used to construct the components. If the tubular components, 12 and 14 are made of a material resistant to damage upon impact such as steel, the components may be constructed of tubular stock having a thickness substantially less than material that is easily damaged upon impact such as aluminum. Consequently steel tubing stock material used to construct the tubular components, 12 and 14 could be, for example, 1/16 inch thick while an aluminum tubular component having a similar damage resistance could be 1/8 inch thick.

The external diameter of the tubular components 12 and 14, will vary depending on the user. In general the

external diameter should be such that it is easily grasped and manipulated by the user during martial arts training exercises. A user with smaller hands, such as a child, will most likely prefer a smaller diameter tubing for the construction of the training device 10. Correspondingly a user with larger hands such as an adult may prefer a larger diameter tubing training device 10. Preferably the diameter of the tubing used to construct the training device 10 is not less than about 1/2 inch and not greater than about 2-1/2 inches. Most preferably, the diameter is not less than about 3/4 inch and not more than about 1-1/2 inches.

The length of the shaft may vary depending on the height of the user. For example, if the user is a small person or child a shorter shaft would be preferred, a shaft not less than about 24 inches and not more than about 48 inches may be appropriate. For a person of five feet in height or taller, the user may prefer a longer shaft one not less than about 48 inches to not more than about 72 inches. Preferably the shaft is about 36 inches for a smaller person or child or about 60 inches for a person of five feet in height or taller. The length of the clubs will vary depending on the length of the shaft. If the connection means were positioned about the middle of the shaft the clubs or tubular components would be the same or approximately the same length. Preferably the length of the tubular components, 12 and 14 for a shorter shaft is not less than about 12 inches to not more than about 24 inches and not less than about 24 inches and not more than about 36 inches for a longer shaft. If the connection means is not positioned in the middle of the shaft the clubs or tubular components, 12 and 14 will be of different lengths. One skilled in the art would recognize that a wide variety

of differing sized clubs or tubular components could be prepared depending on the length of the shaft and the desires of the user. Most preferably, the length of the continuous shaft is about 48 inches, with each of the
5 tubular components, 12 and 14 having a length of about 24 inches.

The tubular components, 12 and 14 may be constructed of a variety of materials that provide strength, durability, impact resistance and are light in weight.
10 Further they may be constructed from tubular or solid stock materials, for the variety of embodiments described herein. When tubing stock is used the end of the tubular components, 12 and 14 may be open or capped. Preferably the tubular components, 12 and 14 are made of wood, plastic
15 polymer, carbon fiber, steel tubing, aluminum tubing or any combination thereof. Preferably, the material is anodized aluminum tubing.

A variety of connection means may be utilized with the present invention between the two tubular components, 12
20 and 14 that provides a durable connection when the device 10 is used as a staff and a quick release method to allow the staff to convert to two clubs when desired.

In one embodiment a receiving means is affixed within the interior surface of the joining end of the first
25 tubular component 12 and a locking means is affixed within the interior surface and projecting from the joining end of the second tubular component 14.

In a preferred embodiment, the receiving means consists of a pin 16 mounted transverse and setback from
30 the joining end within the interior surface of the first tubular component 12. One skilled in the art would recognize that the pin 16 should be constructed of a

5 durable material having the strength to maintain the two tubular components, 12 and 14 together when the device 10 is used as a staff in simulated combat on a repeated or continuous basis. The strength of the pin 16 will vary depending on the diameter, the material used to construct the pin and the length of the pin. If the pin 16 were made of a hardened bend resistant metal its diameter could be narrower than it would have to be if the metal were untreated. Correspondingly, increasing the diameter of the pin 16 will increase its strength. In view of this, one skilled in the art would recognize that the material selected would determine the available diameters having the desired characteristics to construct the pin 16. The pin 16 may be constructed of a variety of material stocks but is preferably a solid metal stock and most preferably made of hardened steel. If the pin 16 is made of metal its diameter is preferably not less than about 1/16 inch and not more than about 5/16 inch. Most preferably, the pin 16 is not less than about 1/8 inch and not more than about 1/4 inch in diameter.

20 The length of the pin 16 may vary depending on the external diameter of the tubular component. Preferably the pin 16 is the same length or just less than the external diameter of the tubular component. For example, if the tubular component has an external diameter of about one inch, the pin 16 would be not more than one inch in length.

25 The pin 16 is set back from the joining end of the first tubular component 12 to engage the locking means projecting from the joining end of the second tubular component 14. This distance will depend on the length of the locking means protruding from the joining end of the second tubular component 14 and will be provided in a

configuration that allows the locking means to securely engage the pin 16, thereby holding the two tubular components, 12 and 14 securely together. One skilled in the art would recognize that the distance the pin 16 is setback
5 from the joining end would be a function of the design of the locking means of the second tubular component 14. Preferably this distance is not less than about 1/4 inch and not more than 5 inches. Most preferably this distance is not less than about 1/2 inch and not more than 2 inches.
10 The pin 16 may be affixed in place by a variety of methods, such as for example, the tubular component may be manufactured having two diametrically opposed apertures wherein the pin 16 is press fit in place. Alternatively, these apertures may be provided with threads to allow a
15 threaded pin 16 to be screwed into place.

In another configuration the receiving means comprises a single pin 16 projecting inward from one side of the interior surface of the tubular component. Alternatively, the receiving means comprises two pins positioned opposite
20 each other and projecting inward from the interior of the tubular component. In each of these configurations the pin, or pins, have the same characteristics as previously mentioned except for their length. Since the pins do not traverse the interior surface of the tubular components 12
25 and 14 they may be significantly shorter in length ranging from about 1/4 to about 3/4 the external diameter of the tubular component. For example if the external diameter of the tubular component is 1 inch having a thickness of about 1/8 inch then a single pin could range in length from not
30 less than about 1/4 inch and not more than about 3/4 inch. If two pins were used their length could range from not less than about 1/4 inch to not more than about 3/8 inch.

In one embodiment, the locking means is affixed within the interior surface of, and projecting from, the joining end of the second tubular component 14. In a preferred embodiment the locking means comprises a cylindrical component 18 having an upper end, a lower end and an external diameter. Its external diameter is preferably slightly less than the internal diameter of the tubular components, 12 and 14 to allow the lower end of the cylindrical component 18 to be easily inserted and affixed.

A variety of methods known to those skilled in the art may be used to affix the cylindrical component 18 within the second tubular component 14, such as for example, brazing, welding, adhesive, friction fit, rivet or press pin. Alternatively, the cylindrical tubing may be press fit into the joining end of the second tubular component 14. In this configuration the diameter of the cylindrical component 18 is slightly larger than the interior diameter of the tubular component. A preferred method is to use both a press fit and a press pin for anchoring the cylindrical component 18 in the joining end of the second tubular component 14.

The upper end of the cylindrical component 18 projects from the joining end of the second tubular component 14 and is able to be inserted into the internal diameter of the first tubular component 12. The upper end of the cylindrical component 18 comprises a hook to engage the pin 16 mounted in the joining end of the first tubular unit 12. In a preferred embodiment, the hook comprises at least two J-shaped notches 20 in the upper end of the cylindrical component 18 opposite each other for engaging the pin 16. In this configuration the upper portion of the J-shaped notches 20 receive the pin 16. Upon further compression the

pin 16 moves down to the lower portion of the J-shaped notches 20. When the pin 16 reaches the base of the J-shaped notches 20 the two tubular components, 12 and 14 are twisted in opposite directions moving the pin 16 into the curved portion of the J-shaped notches 20, thereby locking the two tubular components, 12 and 14 together.

The width of the J-shaped notch 20 is preferably a dimension able to receive the diameter of the pin 16. For example, if the pin 16 diameter is 1/4 inch then the width of the notch would be not less than about 1/4 inch and not more than about 3/8 inch.

The shape of the J-shaped notch 20 may vary from the shape of the letter J to the shape of the letter L at the desire of the user to allow for a quick release with or without a locking connection. Preferably the L-shape provides a secure pressure connection while the J-shape provides a secure locking connection.

The length of the cylindrical component 18 will vary depending on the length of the shaft. In particular, one skilled in the art would recognize that increasing the length of the cylindrical component 18 that will be inserted into the first tubular component 12 would increase the strength and stability of the connection joining the two tubular components, 12 and 14. Preferably the length of the cylindrical component 18 would increase with increasing length of the shaft to impart more strength and stability to the connection between the two tubular components, 12 and 14. For example, if the shaft was about 48 inches to about 60 inches the length of the cylindrical component 18 could be from not less than about 4 inches to not more than about 12 inches. If the shaft was about 24 inches to about 36 inches the length of the cylindrical component 18 could

be from not less than about 1 inch to not more than about 8 inches. Preferably about 1/2 of the length of the cylindrical component 18 is secured within the joining end of the second tubular component 14 to provide the strength
5 necessary for use as a staff.

The thickness of the cylindrical component 18 will vary depending on the structural integrity one skilled in the art would desire for the connection between the two tubular components, 12 and 14 and the method of pressure
10 application utilized to affix the cylindrical component 18 into the tubular component. If the cylindrical component 18 is constructed of tubular stock, the thickness is preferably about the same thickness as the thickness of the tubular components, 12 and 14. The outer diameter of the
15 cylindrical component 18 will depend on the internal diameter of the tubular components, 12 and 14. Preferably, the outer diameter of the portion of the cylindrical component 18 that is affixed within the tubular component is slightly smaller than the interior diameter of the
20 second tubular component 14. Preferably, the outer diameter of the upper end of the cylindrical component 18 will be slightly smaller than the mating internal diameter on the first tubular component 12 for ease of assembly and disassembly. Preferably, the internal diameter of the
25 cylindrical component 18 results in a wall thickness of that portion of the cylindrical component 18 approximately equal to the thickness of the tubular components. The inner diameter will extend some length of the cylindrical component 18, to provide a cavity for the pressure
30 application component. Preferably, the inner diameter will extend about three quarters the length of the cylindrical component 18. A secondary inner diameter may extend the

balance of the length of the locking means if a shaft is used in conjunction with the pressure device, or if a lighter staff is desired.

The cylindrical component 18 may be constructed of a variety of materials such as for example metal, polymer, plastic or carbon fiber. Preferably the cylindrical component 18 is constructed of the same material as the tubular components, 12 and 14. Most preferably the cylindrical component 18 is made of aluminum with an anodized finish.

The length of the J-shaped notch 20 will depend on the length that the cylindrical component 18 projects from the joining end of the second tubular component 14 and the setback distance of the pin 16 in the joining end of the first tubular component 12. Preferably the length of the notch is such that when engaging the pin 16 and locking it in place the two tubular components, 12 and 14 are held together firmly. In a preferred embodiment a mechanical means is provided that allows for compression of the two tubular components, 12 and 14 to move the pin 16 through the full length of the J-shaped notch 20 and a continuing pressure as the pin 16 comes to rest in the end of the J-shaped notch 20 locking the two tubular components, 12 and 14 together. This mechanical means can be provided by a variety of methods known to those skilled in the art including for example a rubber compression ring, a compressible O-ring or a spring.

In one embodiment, the locking means includes a spring 24 to assist in holding the pin 16 securely in the J-shaped notch 20. In one configuration the spring 24 has a bottom end affixed within the lower end of the cylindrical component 18 having the largest external diameter for

affixing within the tubular component and a top end being about flush with the upper end of the cylindrical component 18 when uncompressed. The spring 24 compresses when the J-shaped notch 20 of the cylindrical component 18 of the second tubular component 14 engages the pin 16 of the first tubular component 12 as the cylindrical component 18 is inserted into the joining end of the first tubular component 12. Once the pin 16 reaches the base of the J-shaped notch 20 the two tubular components, 12 and 14 are twisted in opposite directions to hook the pin 16, and then allowed to separate until the pin 16 engages the upper looped portion of the J-shaped notch 20. The pressure provided by the spring 24 serves to hold the pin 16 within the notch, thus securing the two tubular components, 12 and 14 into a single staff. In another configuration, the locking means comprises a shaft within the spring 24 with one end of the shaft slidably affixed to the top end of the spring 24, and the other end slidably affixed to the lower end of the cylindrical component 18. The shaft may be secured to the cylindrical component 18 by threaded nut, retaining pin or other similar method. One skilled in the art would recognize that the size and compressive strength of the spring 24 would be a function of the compressive force required to ensure that the shaft remains joined when used as a training device 10, and the releasing pressure necessary for smooth operation of the device 10.

In one configuration, the cylindrical component 18 is made of solid stock material with at least one J-shaped groove provided on its surface or cut through the cylinder to receive the pin or pins 16.

During martial arts training, the staff may be converted into martial arts training clubs. To make this

conversion, the user grasps the training staff about the middle of a first tubular component 12 with one hand and about the middle of the second tubular component 14 with the other hand, then compresses the first tubular component 12 toward the second tubular component 14, twisting the tubular components in opposite directions to disengage and then separate them into martial arts training clubs. This action may be reversed to convert the two clubs into a single martial arts training staff.

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THREE COMPONENT MARTIAL ARTS TRAINING DEVICE

Another aspect of the invention provides a device 40 that may be used as a martial arts training staff or for stretching and flexing the user's legs as a warm up exercise prior to training. The device 40 comprises three tubular units each having at least one joining end, an interior surface and an exterior surface, a connection means affixed within the interior surface of the joining ends to removably affix the tubular units together to form a continuous shaft or staff, and at least two leg attachment means 48 able to be affixed to the exterior surfaces of at least two of the tubular units. In one configuration the staff comprises three tubular units, a first tubular unit 42 having a first end and a second end, a second tubular unit 44 having a third and fourth end and a third tubular unit 46 having a fifth and sixth end.

The first and third tubular units, 42 and 46 have internal and external surfaces and a plurality of apertures 50 positioned linearly along their lengths to provide a means for adjustment according to the user's needs. The three tubular units may be constructed in a similar or identical manner as described above for the two tubular

components. In particular their thickness, diameters and material compositions are similar, or identical, to that described for the tubular components.

5 The length of the shaft or staff may vary depending on the height of the user as stated for the two component martial arts training device 40. For example, if the user is a small person or child a shorter shaft would be preferred for example a shaft not less than about 24 inches and not more than about 48 inches may be appropriate. For a
10 person of five feet in height or taller the shaft may be longer, from not less than about 48 inches to not more than about 72 inches. Preferably the shaft is about 36 inches for a smaller person or child or about 60 inches for a person of five feet in height or taller.

15 The length of the first and third tubular units, 42 and 46 will vary depending on the length of the shaft. If the connection means were positioned approximately one third and approximately two thirds along the length of the shaft the tubular units would be the same or approximately
20 the same length. Consequently, for a shorter staff, one between about 24 inches and about 48 inches, the tubular units would have a length not less than about 8 inches and not more than about 13 inches. Correspondingly, for a longer staff, one between about 48 inches to about 72
25 inches, the tubular units would have a length of about 13 inches to about 24 inches. If the connection means is not positioned at about one third and about two thirds of the length of the shaft, the first and third tubular units, 42 and 46 may have a different length than the second tubular
30 unit 44. One skilled in the art would recognize that a wide variety of configurations could be prepared based on the desires of the user, including the first and third tubular

units, 42 and 46 being of equal length with the second unit being shorter than the first and third tubular units, 42 and 46. Correspondingly, the first and third tubular units, 42 and 46 may be of equal length and the second tubular unit 44 is longer than the first and third tubular units, 42 and 46. Alternatively, each of the tubular units may be of differing size depending on the requirements of the user. Most preferably, the length of the continuous shaft is 60 inches, with each of the tubular units being of approximately equal length.

The first and third tubular units, 42 and 46 comprise diametrically opposed apertures 50 arranged linearly along their length at approximately equal spacing. These apertures are used to secure the leg attachment means 48 to the first and third tubular units, 42 and 46 and are of a diameter able to accept the pins 52 affixed to the leg attachment means 48. The spacing between the apertures 50 will depend on the length of the shaft and the incremental distance that will effect leg stretching desired by the user. With a shorter shaft, the apertures 50 may be spaced closer together while a longer shaft may provide the apertures 50 spaced at a greater distance. Preferably the number of apertures 50 on the first and third tubular units, 42 and 46 remains the same. However, having fewer apertures 50 on a shorter shaft, or a greater number of apertures 50 on a longer shaft is within the scope of the invention. For example, if the shaft is 48 inches in length, the first and third tubular units, 42 and 46 may each have nine apertures 50 spaced apart at approximately 1.6 inches on center. Correspondingly if the shaft is 60 inches, with the first and third tubular units, 42 and 46 having the same number of apertures 50 as in the shorter

shaft, the apertures 50 may be spaced apart at about 2.0 inches on center. Preferably, these apertures 50 are spaced equal distances from each other. However, depending on the desires of the user, they may be spaced at differing
5 distances such as, for example, the apertures 50 closest to the second tubular unit 44 might be spaced farther apart than those apertures 50 located more distant from the second tubular unit 44. Preferably the shaft or staff is about 60 inches in length with the first, second and third
10 tubular units 42, 44 and 46 being approximately the same length and the first and third tubular units, 42 and 46 having about nine apertures 50 linearly arranged along their lengths spaced at about 2.0 inches on center.

The diameter of the apertures 50 may vary depending on
15 the diameter of the pins 52 affixed to the leg attachment means 48. Preferably the diameter is not less than about 3/16 inch and not more than about 1/2 inch.

The external surface of the second tubular unit 44 may further comprise a gripping means 54 such as, for example,
20 machined serrations, or leather or rubber wraps. Preferably, the gripping means 54 is a machined surface in aluminum material, which is subsequently anodized.

The first tubular unit 42 comprises a connecting means on the second end, the third tubular unit 46 comprises a
25 connecting means on the fifth end and the second tubular unit 44 comprises a connecting means on both ends. More specifically the connecting means on the third end of the second tubular unit 44 is able to receive the connecting means of the first tubular unit 42 and the fourth end of
30 the second tubular unit 44 is able to receive the connecting means of the third tubular unit 46.

In a preferred embodiment, the connecting means consists of a first threaded dowel 56 extending from the second end of the first tubular unit 42, a second threaded dowel 58 extending from the fifth end of the third tubular unit 46, with the internal surface of the third end of the second tubular unit 44 being threaded 60 and able to receive the threaded dowel 56 extending from the first tubular unit 42, and the internal surface of the fourth end of the second tubular unit 44 being threaded 62 and able to receive the threaded dowel 58 extending from the fifth end of the third tubular unit 46. Alternatively, the connecting means consists of a first threaded dowel extending from the third end of the second tubular unit 44, a second threaded dowel extending from the forth end of the second tubular unit 44, with the internal surface of the second end of the first tubular unit 42 being threaded and able to receive the threaded dowel extending from the third end of the second tubular unit 44, and the internal surface of the fifth end of the third tubular unit 46 being threaded and able to receive the threaded dowel extending from the forth end of the second tubular unit 44. In either configuration it is desired that when the second tubular unit 44 is rotated that the first and third tubular units, 42 and 46 uniformly extend from the second tubular unit 44 when rotation is in one direction and contract toward the second tubular unit 44 when the second tubular unit 44 is rotated in the opposite direction. This may be accomplished in a variety of ways. For example if the threaded dowels are provided on the first and third tubular units, 42 and 46 then it is preferable that the threading on the threaded dowel of the first tubular unit 42 be a right-handed thread and the threading on the threaded dowel of the third

tubular unit 46 be a left-hand thread, with the threading on both tubular units being the same pitch. The threading may be provided in variety of orientations that allow for a desired incremental movement of the first and third tubular units, 42 and 46 with respect to the second tubular unit 44. In a preferred embodiment the threads are provided at about 1 to 3 threads per inch at a pitch of at about a 25 to about a 45-degree orientation. The threaded receiving means may be provided in a variety of configurations. In one configuration, the threaded receiving means is a nut permanently affixed to the internal surface of the tubular unit and able to receive the threaded dowel.

The dowels 56 and 58 may be constructed by a variety of methods, for example, they may be form molded as a single piece with the tubular unit, machined from stock material as a single piece with the tubular unit or prepared separately and affixed to the tubular unit. If the dowels 56 and 58 are prepared by machining they may be cut from solid or tubular stock materials. Depending on the weight desired for the completed staff the user may select either solid stock for a heavier shaft or tubular stock to provide a lighter shaft. Preferably, the dowels 56 and 58 are machined from solid metal stock. Most preferably from solid aluminum stock that may be anodized after machining.

If the dowels 56 and 58 are prepared separately, the threading may be provided on not less than about 60 percent and not more than about 90 percent of its length. The remaining 10 to 40 percent of the dowel is provided with an exterior diameter of slightly less than the internal diameter of the tubular unit. This will allow the dowels to be securely affixed within the second end of the first tubular unit 42 and the fifth end of the third tubular unit

46. The dowels 56 and 58 may be affixed in the tubular units by a variety of methods known to those skilled in the art, such as for example, by welding, brazing, adhesive or press-fit pins or rivets. Alternatively the dowels may be
5 press fit into the tubular units. In the case the outside diameter of the dowel to be press fit into the tubular unit, the outside diameter of the dowel is slightly larger than the internal diameter of the tubular unit.

The length of the dowels will vary and depend on the
10 length of the shaft, the desired range of stretching, and the capacity of the second tubular unit 44 to receive both dowels. Preferably the second tubular unit 44 is provided at a length able to receive the full length of the dowels, although this is not a requirement. In addition, the dowel
15 length may be provided to accommodate the user's desired range of stretching for training purposes. In a preferred embodiment, the length of the shaft is about 60 inches, the length of the tubular units are about 20 inches and the length of the dowels are about 12 inches in which
20 approximately 2 inches of that length is affixed within the tubular units.

The receiving means that is provided in the third and forth ends of the second tubular unit 44 may comprise a threaded nut permanently affixed to the interior surface of
25 the second tubular unit 44. The nuts may be constructed by a variety of methods known in the art, for example they may be form molded with the tubular unit as a single piece, machined from stock material with the tubular unit as a single piece or prepared separately and affixed within the
30 tubular unit. If the nuts are prepared separately they may be cut from solid or tubular stock materials.

One skilled in the art would recognize that resistance to travel of the dowels 56 and 58 within the nuts, can be affected by the material used to construct the nuts. In one embodiment, the nuts are made from a material that
5 requires application of an external lube material to enable the dowels to travel within the nuts without binding or galling. For example a lubricant such as TeflonTM grease. Preferably, the material used to construct the nut provides an inherent lubricity to enable the dowels to travel
10 smoothly. Most preferably, the nuts are made from a Teflon-type material for those desiring a lighter staff or a bronze-type material for those individuals desiring a heavier staff.

Nuts that are manufactured separately from the second
15 tubular unit 44, may be permanently affixed to the third and forth ends of the second tubular unit by a variety of methods, such as, for example, by welding, brazing, adhesive, pins, rivets, or press-fit directly into the tubular unit. Alternatively, affixing means may be
20 combined to ensure the nuts remain affixed during utilization of the staff. Nuts that are pressed and/or bonded to the interior surface of the second tubular unit 44, may comprise an external shoulder matching the outer diameter of the tubular unit. The purpose of said shoulder
25 would be to increase the resistance to migration of the nut within the tubular unit. In a preferred embodiment, the shoulder would be not less than about 1/16" in thickness, and not more than about 1/4" in thickness.

The length of the nuts may vary from a minimum of
30 about 1-inch to not more than about 10 inches, depending upon the desired strength and motion characteristics of the connecting means between the tubular units. Shorter nuts

may provide less resistance to travel, while offering lower thread strength and more relative motion between the tubular units. Longer nuts may reduce the amount the dowels move laterally within the nuts, while offering
5 increased resistance to longitudinal dowel travel and thread shear strength. The length of the thread within the nuts may vary with the length of the nut, and may be provided on not less than about 20 percent, and not more 100 percent. In one embodiment, the nuts will be not less
10 than about 1 inch in length, and not more than about 10 inches in length. In a preferred embodiment, each nut will be about 2 inches in length, with the thread extending along the entire length of the nut.

The thread in the nut in the third end of the second
15 tubular unit 44 will be a right-hand thread, with a pitch matching that of the dowel on the second end of the first tubular unit 42. The thread in the nut in the fourth end of the second tubular unit 44 will be a left-hand thread, with a pitch matching that of the dowel on the fifth end of
20 the third tubular unit 46. Preferably, the pitch of said threads will be about 1 to 3 threads per inch.

In one embodiment, at least two leg attachment means 48 are provided. Preferably there is one leg attachment means 48 for each leg. The leg attachment means 48
25 comprises a flexible strap having a pin 52 for connecting the attachment means 48 to the shaft, and a means to secure the strap to the user's leg. One skilled in the art would recognize that the means to secure the strap should be easily operated and durable, such as, for example, a
30 buckle, hoop and loop method, D-rings, etc. Preferably, 2 D-rings are permanently affixed to one end of the leg attachment means 48, to afford infinite adjustability. The

D-rings may be wider or narrower than the strap, and D-rings of differing sizes may be installed on the same strap. The preferred configuration consists of 2 similarly sized D-rings, made of metal or plastic, with a nominal 2-
5 inch long straight length for strap.

The pins 52 may be permanently or removably affixed to the strap, and are provided in a length that allows them to easily pass through the apertures 50 of the tubular units and securely fastened in place. Preferably the pins 52 are
10 removable, and have a straight section not less than about 1.25 times the external diameter of the tubular units, and not more than about 2 times the exterior diameter of the tubular units.

The diameter of the pins 52 is preferably slightly
15 less than the diameter of the apertures 50 in the first and third tubular units, 42 and 46 to provide a relatively snug fit. The pin 52 must incorporate a method to be secured to the shaft during use. Preferably, the pin 52 would have an aperture at the end away from the strap, and a self-
20 retaining device to engage said aperture would be attached to the strap by means of a lanyard. The pin 52 could be constructed of a variety of materials known to those skilled in the art that provide the strength required to maintain the strap on the tubular unit. Preferably, the
25 pins 52 are made of aluminum having a diameter not less than about 1/8 inch and not more than about 3/8 inch.

The straps of the leg attachment means 48 may be constructed of a variety of materials known to those skilled in the art, such as for example, nylon, leather, or
30 other synthetic material with the strength and flexibility to provide a comfortable attachment to the legs. The width of the straps may vary depending on the comfort desired by

the user. Preferably the width is not less than about 1 inch and not more than about 3 inches.

To prevent the leg attachment means 48 from slipping at the legs of the user a restraining means 64 may be
5 removably affixed to both adjustable straps and held in place behind the user. The restraining means 64 may be constructed of a variety of materials known to those skilled in the art, such as for example, nylon, leather, or other synthetic material with the strength and
10 adjustability to allow ease of attachment to the straps and comfort to the user. Preferably, the material is the same as used for the adjustable straps. The width of the restraining means 64 may vary depending on the comfort desired by the user. It may be uniform in width or may vary
15 over its length. For example, the width toward the middle of the strap may be wider than the ends. Preferably the width is not less than about 1 inch and not more than about 6 inches.

The retaining means 64 could be comprised of single or
20 multiple components to effect the preferred placement of the leg straps. Preferably, the retaining means 64 will consist of two individual elements, each having a permanent loop to attach to the leg strap on one end, and compatible mating features on the other end. The mating features are
25 to be easily engaged and disengaged, and must afford the ability to adjust the retaining means 64 to suit the strap retention requirements of the user. Preferably, the retaining means 64 will employ two D-rings permanently affixed to one end of a short segment, and a radiused end
30 for ease of engagement, on the mating segment. This approach yields infinite adjustability when used to prevent the legs straps from sliding down the user's legs during

use of the device 40 as a stretching implement. The D-rings may be wider or narrower than the retaining means 64, and D-rings of differing sizes may be installed on the said means. The preferred configuration consists of two
5 similarly sized D-rings, made of metal or plastic, appropriately sized to the retaining means 64.

USE OF THE THREE COMPONENT MARTIAL ARTS TRAINING DEVICE

To assist flexibility prior to beginning martial arts
10 training, the martial arts training staff may be utilized as a stretching device for the legs. To use the staff as a stretching device the staff must first be assembled. Affix a first tubular unit to a second tubular unit by inserting a right-handed threaded dowel extending from the second end
15 of the first tubular unit into the right-handed threaded nut in the third end of the second tubular unit, then affix a third tubular unit to the second tubular unit by inserting a left-handed threaded dowel extending from the fifth end of the third tubular unit into the left-handed
20 nut in the fourth end of the second tubular unit. To convert the staff to a stretching device, first attach the straps and restraining means (optional) to the user's legs. If the restraining means is to be employed, the means should be attached to the leg straps and routed behind the
25 user's back prior to securing the legs straps to the user's legs. While sitting on the floor with the staff in front of the user affix the right leg to the first tubular unit by inserting the leg strap pin into the desired aperture, and secure the leg strap pin to the tubular unit. The user's
30 legs should be spread to the maximum extent, then affix the left leg to the third tubular unit by inserting the leg strap pin into the desired aperture, and secure the leg

strap pin to the tubular unit. Adjust both leg straps and restraining means such that the straps are secure on the legs, and the restraining means is tight across the users' back. The user may then rotate the second tubular unit, 5 which unthreads the first tubular unit and the third tubular unit extending them from the second tubular unit, thereby assisting in flexing and stretching the user's legs.